Prevention of atherosclerosis and obesity with D-psicose

(Keywords: D-Psicose, Atherosclerosis, Obesity, Cholesterol)

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Outline of technology

To evaluate the potential of D-psicose as a drug or quasi drug, its effects on atherosclerosis were studied. As a result, D-psicose was found to suppress the secretion of monocyte chemoattractant peptide-1 (MCP-1), an atherosclerosis promoter factor, from vascular endothelial cells (Figure). We also evaluated the expression of HDL receptor CLA-1, which mediates cholesterol uptake by the liver (reverse cholesterol transport system). Clinically, the activity of the reverse cholesterol transport system has been reported to be reduced in diabetic patients. Experiments using rats indicated that D-glucose at a high concentration suppresses the expression of CLA-1, causing a reduction in the activity of the reverse cholesterol transport system, but no decrease in the CLA-1 expression due to high D-glucose was observed when the animals were administered D-psicose. D-Psicose, which inhibits the secretion of MCP-1 and prevents the decrease in the expression of CLA-1, is considered to be promising as a drug for the prevention and treatment of atherosclerosis.

Sales points

- Suppresses the synthesis of lipids in the liver.
- Promotes cholesterol uptake from blood by the liver.
- Suppresses the accumulation of lipids in the muscles.

Expected application fields and products

(1) Prevention of atherosclerosis/obesity
(2) Drugs
(3) Foods for specified health uses
(4) Food materials, foods and beverages, healthy foods and beverages

Comparison with existing products

<table>
<thead>
<tr>
<th></th>
<th>Anti-atherosclerotic effect</th>
<th>Cholesterol-reducing effect</th>
<th>Stability in water and applicability to foods</th>
<th>Anti-hyperglycemic effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-Psicose</td>
<td>Observed</td>
<td>Observed</td>
<td>High</td>
<td>Observed</td>
</tr>
<tr>
<td>Eicosapentenoic acid/ Docosahexaenoic acid (EPA/DHA)</td>
<td>Observed</td>
<td>Observed</td>
<td>Low</td>
<td>None</td>
</tr>
<tr>
<td>Oleic acid</td>
<td>Observed</td>
<td>Observed</td>
<td>Low</td>
<td>None</td>
</tr>
</tbody>
</table>

References, patents, etc.


Other matters to note

(Developer’s comment)
D-Psicose is a monosaccharide with not only an anti-hyperglycemic but also anti-atherosclerotic effect and is effective for the prevention of both diabetes (hyperglycemia) and atherosclerosis (hypercholesterolemia, hypertriglyceridemia), both of which often complicate metabolic syndrome. The action mechanism has been clarified by research at our university.
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